

Abstract

The subject invention pertains to a method for high speed, continuous manufacture of graded refractive index polymer optical fiber. The subject fiber material may be organic or perfluorinated. The subject method can include first forming energy activatable prepolymer compositions containing additives. The prepolymer compositions can be extruded at low temperature through a multi-annular die and surrounded by a co-extruded concentric melt stream which forms a tube with good structural integrity. The prepolymer compositions contained in the tube can be maintained at a temperature for a time sufficient to form the desired graded index profile. Energy can be delivered to the prepolymer compositions which can cause an irreversible chemical transformation and forms a mechanically and thermally stable polymer. A continuous process of thermal annealing of the fiber can be used to minimize residual stress. Multiple fibers may be produced simultaneously in a variety of physical configurations.